

SEQUENCE LISTING

<110> MedImmune Vaccines, Inc.
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Park, Hyun J
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<120> COMPOSITIONS AND METHODS INVOLVING RESPIRATORY SYNCYTIAL VIRUS
SUBGROUP B STRAIN 9320

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<170> PatentIn version 3.1

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catctacgca	ggagaaaaaa	acaatgccag	tgtataatag	acaagtttta	acaaaaagc	12360
aaagagacca	aatagattta	ttagcaaaat	tagactgggt	atatgcatcc	atagacaaca	12420
aagatgaatt	catggaagaa	ctgagtactg	gaacacttgg	attgtcatat	gaaaaagcca	12480
aaaaattggt	tccacaatat	ctaagtgtca	attatttaca	ccgcttaaca	gtcagtagta	12540
ggccatgtga	attccctgca	tcaataccag	cttatagaac	aacaaattat	catttctgata	12600
ctagtcctat	caatcatgta	ttaacagaaa	agtatggaga	tgaagatatc	gacatagtgt	12660
ttcaaaattg	cataagtttt	ggtcttagcc	taatgtcggg	tgtggaacaa	ttcacaaaaca	12720
tatgtcctaa	tagaattatt	ctcataccga	agctgaatga	gatacatttg	atgaaacctc	12780
ctatattttac	aggagatggt	gatatcatca	aattgaagca	agtgatacaa	aaacagcaca	12840
tgttcctacc	agataaaata	agtttaaccc	aatatgtaga	attatttcta	agtaaçaaaag	12900
cacttaaatac	tggatctcac	atcaactcta	atttaaatatt	agtacataaa	atgtctgatt	12960
attttcataa	tgattatatt	ttaagtacta	atttagctgg	acattggatt	ctgattattc	13020
aacttatgaa	agattcaaaa	ggtattttttg	aaaaagattg	gggagagggg	tatataactg	13080
atcatatggt	cattaatttg	aatgttttct	ttaatgctta	taagacttat	ttgctatggt	13140
ttcataaagg	ttatggtaaa	gcaaaattag	aatgtgatat	gaacacttca	gatcttcttt	13200
gtgttttgga	gttaatagac	agtagctact	ggaaatctat	gtctaaagtt	ttcctagaac	13260
agaaagtcac	aaaatacata	gtcaatcaag	acacaagttt	gcatagaata	aaagggtgtc	13320
atagtttttaa	gttggtgggtt	ttaaaacgcc	ttaataatgc	taaatttacc	gtatgccctt	13380
gggttggttaa	catagattat	cacccaacac	acatgaaagc	tatattatct	tacatagatt	13440
tagttagaat	gggggttaata	aatgtagata	aattaaccat	taaaaataaa	aacaaattca	13500

atgatgaatt	ttacacatca	aatctctttt	atattagtta	taacttttca	gacaacactc	13560
atgttgctaac	aaaacaaata	agaattgcta	attcagaatt	agaaaataat	tataacaaac	13620
tatatcaccc	aaccccagaa	actttagaaa	atatgtcatt	aattcctggt	aaaagtaaca	13680
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tctccaataa	aatgcatatt	aatctttcca	ctgttaccac	aagattaaac	tatagcaaac	13800
aagacttgta	caatttattt	ccaattgttg	tgatagacag	gattatagat	cattcaggca	13860
atacagcaaa	atccaaccaa	ctttacacca	ccacttcaca	tcagacatct	ttagtaagga	13920
atagtgcac	actttattgc	atgcttcctt	ggcatcatgt	caatagattt	aactttgtat	13980
ttagttccac	aggatgcaag	atcagtatag	agtatatttt	aaaagatcct	aagattaagg	14040
acccagttg	tatagcattc	ataggtgaag	gagctggtaa	cttattatta	cgtacggtag	14100
tagaacttca	tccagacata	agatacattt	acagaagttt	aaaagattgc	aatgatcata	14160
gtttacctat	tgaatttcta	aggttataca	acgggcatat	aaacatagat	tatggtgaga	14220
atttaaccat	tcctgctaca	gatgcaacta	ataacattca	ttggtcttat	ttacatataa	14280
aatttgcaga	acctattagc	atctttgtct	gcgatgctga	attacctggt	acagccaatt	14340
ggagtaaaat	tataattgaa	tggagtaagc	atgtaagaaa	gtgcaagtac	tgttcctctg	14400
taaatagatg	cattttaatt	gcaaaatatc	atgctcaaga	tgatattgat	ttcaaattag	14460
ataacattac	tatattaaaa	acttatgtgt	gcctaggtag	caagttaaaa	ggatctgaag	14520
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atgctaaatt	gattctttca	agaactaaaa	atttcattat	gcctaaaaaa	actgacaaaag	14640
aatctatcga	tgcaaatatt	aaaagcttaa	tacctttcct	ttgttaccct	ataacaaaaa	14700
aaggaattaa	gacttcattg	tcaaaaattga	agagtgtagt	taatggagat	atattatcat	14760
attctatagc	tggacgtaat	gaagtattca	gcaacaagct	tataaaccac	aagcatatga	14820
atatacctaaa	atggctagat	catgttttaa	actttagatc	aactgaactt	aattacaatc	14880
atttatatat	gatagagtcc	acatatcctt	acttaagtga	attgttaaat	agtttaacaa	14940
ccaatgagct	caaaaagctg	attaaaatta	caggtagtgt	actatacaac	cttcccaatg	15000
aacagtaact	taaaatatca	ttaacaagtt	tggtcaaatt	tagatgctaa	cacatcatta	15060
tattatagtt	attaaaaaat	atgcaaaact	ttcaataatt	tagcatattg	attccaaaaat	15120
tatctatttt	ggtcttaagg	ggttaaataa	aaatctaaaa	ctaacaatta	tacatgtgca	15180
tttacaacac	aacgagacat	tagtttttga	cacttttttt	ctcgt		15225

<210> 2
 <211> 139
 <212> PRT
 <213> respiratory syncytial virus B 9320

<400> 2

Met Gly Cys Asn Ser Leu Ser Met Ile Lys Val Arg Leu Gln Asn Leu
 1 5 10 15

Phe Asp Asn Asp Glu Val Ala Leu Leu Lys Ile Thr Cys Tyr Thr Asp
 20 25 30

Lys Leu Ile Leu Leu Thr Asn Ala Leu Ala Lys Ala Ala Ile His Thr
 35 40 45

Ile Lys Leu Asn Gly Ile Val Phe Ile His Val Ile Thr Ser Ser Glu
 50 55 60

Val Cys Pro Asp Asn Asn Ile Val Val Lys Ser Asn Phe Thr Thr Met
 65 70 75 80

Pro Ile Leu Gln Asn Gly Gly Tyr Ile Trp Glu Leu Ile Glu Leu Thr
 85 90 95

His Cys Ser Gln Leu Asn Gly Leu Met Asp Asp Asn Cys Glu Ile Lys
 100 105 110

Phe Ser Lys Arg Leu Ser Asp Ser Val Met Thr Asp Tyr Met Asn Gln
 115 120 125

Ile Ser Asp Leu Leu Gly Leu Asp Leu Asn Ser
 130 135

<210> 3
 <211> 124
 <212> PRT
 <213> respiratory syncytial virus B 9320

<400> 3

Met Ser Thr Thr Asn Asn Asn Thr Thr Met Gln Arg Leu Met Ile Thr
 1 5 10 15

Asp Met Arg Pro Leu Ser Met Glu Ser Ile Ile Thr Ser Leu Thr Lys
 20 25 30

Glu Ile Ile Thr His Lys Phe Ile Tyr Leu Ile Asn Asn Glu Cys Ile

35	40	45																	
Val	Arg	Lys	Leu	Asp	Glu	Arg	Gln	Ala	Thr	Phe	Thr	Phe	Leu	Val	Asn				
50						55					60								
Tyr	Glu	Met	Lys	Leu	Leu	His	Lys	Val	Gly	Ser	Thr	Lys	Tyr	Lys	Lys				
65					70					75					80				
Tyr	Thr	Glu	Tyr	Asn	Thr	Lys	Tyr	Gly	Thr	Phe	Pro	Met	Pro	Ile	Phe				
				85					90					95					
Ile	Asn	His	Gly	Gly	Phe	Leu	Glu	Cys	Ile	Gly	Ile	Lys	Pro	Thr	Lys				
			100					105					110						
His	Thr	Pro	Ile	Ile	Tyr	Lys	Tyr	Asp	Leu	Asn	Pro								
		115					120												
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<211>	391																		
<212>	PRT																		
<213>	respiratory syncytial virus B 9320																		
<400>	4																		
Met	Ala	Leu	Ser	Lys	Val	Lys	Leu	Asn	Asp	Thr	Leu	Asn	Lys	Asp	Gln				
1				5					10					15					
Leu	Leu	Ser	Ser	Ser	Lys	Tyr	Thr	Ile	Gln	Arg	Ser	Thr	Gly	Asp	Asn				
			20					25					30						
Ile	Asp	Thr	Pro	Asn	Tyr	Asp	Val	Gln	Lys	His	Leu	Asn	Lys	Leu	Cys				
	35						40					45							
Gly	Met	Leu	Leu	Ile	Thr	Glu	Asp	Ala	Asn	His	Lys	Phe	Thr	Gly	Leu				
	50					55					60								
Ile	Gly	Met	Leu	Tyr	Ala	Met	Ser	Arg	Leu	Gly	Arg	Glu	Asp	Thr	Ile				
65					70					75					80				
Lys	Ile	Leu	Lys	Asp	Ala	Gly	Tyr	His	Val	Lys	Ala	Asn	Gly	Val	Asp				
				85					90					95					
Ile	Thr	Thr	Tyr	Arg	Gln	Asp	Ile	Asn	Gly	Lys	Glu	Met	Lys	Phe	Glu				
			100					105						110					
Val	Leu	Thr	Leu	Ser	Ser	Leu	Thr	Ser	Glu	Ile	Gln	Val	Asn	Ile	Glu				

115	120	125															
Ile Glu Ser Arg Lys Ser Tyr Lys Lys Met Leu Lys Glu Met Gly Glu																	
130	135	140															
Val Ala Pro Glu Tyr Arg His Asp Ser Pro Asp Cys Gly Met Ile Ile																	
145	150	155															160
Leu Cys Ile Ala Ala Leu Val Ile Thr Lys Leu Ala Ala Gly Asp Arg																	
	165	170															175
Ser Gly Leu Thr Ala Val Ile Arg Arg Ala Asn Asn Val Leu Lys Asn																	
	180	185															190
Glu Ile Lys Arg Tyr Lys Gly Leu Ile Pro Lys Asp Ile Ala Asn Ser																	
	195	200															205
Phe Tyr Glu Val Phe Glu Lys His Pro His Leu Ile Asp Val Phe Val																	
	210	215															220
His Phe Gly Ile Ala Gln Ser Ser Thr Arg Gly Gly Ser Arg Val Glu																	
225	230	235															240
Gly Ile Phe Ala Gly Leu Phe Met Asn Ala Tyr Gly Ser Gly Gln Val																	
	245	250															255
Met Leu Arg Trp Gly Val Leu Ala Lys Ser Val Lys Asn Ile Met Leu																	
	260	265															270
Gly His Ala Ser Val Gln Ala Glu Met Glu Gln Val Val Glu Val Tyr																	
	275	280															285
Glu Tyr Ala Gln Lys Leu Gly Gly Glu Ala Gly Phe Tyr His Ile Leu																	
	290	295															300
Asn Asn Pro Lys Ala Ser Leu Leu Ser Leu Thr Gln Phe Pro Asn Phe																	
305	310	315															320
Ser Ser Val Val Leu Gly Asn Ala Ala Gly Leu Gly Ile Met Gly Glu																	
	325	330															335
Tyr Arg Gly Thr Pro Arg Asn Gln Asp Leu Tyr Asp Ala Ala Lys Ala																	
	340	345															350

Tyr Ala Glu Gln Leu Lys Glu Asn Gly Val Ile Asn Tyr Ser Val Leu
 355 360 365

Asp Leu Thr Ala Glu Glu Leu Glu Ala Ile Lys His Gln Leu Asn Pro
 370 375 380

Lys Glu Asp Asp Val Glu Leu
 385 390

<210> 5
 <211> 241
 <212> PRT
 <213> respiratory syncytial virus B 9320

<400> 5

Met Glu Lys Phe Ala Pro Glu Phe His Gly Glu Asp Ala Asn Asn Lys
 1 5 10 15

Ala Thr Lys Phe Leu Glu Ser Ile Lys Gly Lys Phe Ala Ser Ser Lys
 20 25 30

Asp Pro Lys Lys Lys Asp Ser Ile Ile Ser Val Asn Ser Ile Asp Ile
 35 40 45

Glu Val Thr Lys Glu Ser Pro Ile Thr Ser Gly Thr Asn Ile Asn Asn
 50 55 60

Pro Thr Ser Glu Ala Asp Ser Thr Pro Glu Ala Lys Thr Asn Tyr Pro
 65 70 75 80

Arg Lys Pro Leu Val Ser Phe Lys Glu Asp Leu Thr Pro Ser Asp Asn
 85 90 95

Pro Phe Ser Lys Leu Tyr Lys Glu Thr Ile Glu Thr Phe Asp Asn Asn
 100 105 110

Glu Glu Glu Ser Ser Tyr Ser Tyr Glu Glu Ile Asn Asp Gln Thr Asn
 115 120 125

Asp Asn Ile Thr Ala Arg Leu Asp Arg Ile Asp Glu Lys Leu Ser Glu
 130 135 140

Ile Leu Gly Met Leu His Thr Leu Val Val Ala Ser Ala Gly Pro Thr
 145 150 155 160

Ser Ala Arg Asp Gly Ile Arg Asp Ala Met Val Gly Leu Arg Glu Glu
165 170 175

Met Ile Glu Lys Ile Arg Ala Glu Ala Leu Met Thr Asn Asp Arg Leu
180 185 190

Glu Ala Met Ala Arg Leu Arg Asn Glu Glu Ser Glu Lys Met Ala Lys
195 200 205

Asp Thr Ser Asp Glu Val Ser Leu Asn Pro Thr Ser Lys Lys Leu Ser
210 215 220

Asp Leu Leu Glu Asp Asn Asp Ser Asp Asn Asp Leu Ser Leu Asp Asp
225 230 235 240

Phe

<210> 6
<211> 256
<212> PRT
<213> respiratory syncytial virus B 9320

<400> 6

Met Glu Thr Tyr Val Asn Lys Leu His Glu Gly Ser Thr Tyr Thr Ala
1 5 10 15

Ala Val Gln Tyr Asn Val Leu Glu Lys Asp Asp Asp Pro Ala Ser Leu
20 25 30

Thr Ile Trp Val Pro Met Phe Gln Ser Ser Val Pro Ala Asp Leu Leu
35 40 45

Ile Lys Glu Leu Ala Ser Ile Asn Ile Leu Val Lys Gln Ile Ser Thr
50 55 60

Pro Lys Gly Pro Ser Leu Arg Val Thr Ile Asn Ser Arg Ser Ala Val
65 70 75 80

Leu Ala Gln Met Pro Ser Asn Phe Ile Ile Ser Ala Asn Val Ser Leu
85 90 95

Asp Glu Arg Ser Lys Leu Ala Tyr Asp Val Thr Thr Pro Cys Glu Ile
100 105 110

Lys Ala Cys Ser Leu Thr Cys Leu Lys Val Lys Ser Met Leu Thr Thr
 115 120 125

Val Lys Asp Leu Thr Met Lys Thr Phe Asn Pro Thr His Glu Ile Ile
 130 135 140

Ala Leu Cys Glu Phe Glu Asn Ile Met Thr Ser Lys Arg Val Ile Ile
 145 150 155 160

Pro Thr Tyr Leu Arg Ser Ile Ser Val Lys Asn Lys Asp Leu Asn Ser
 165 170 175

Leu Glu Asn Ile Ala Thr Thr Glu Phe Lys Asn Ala Ile Thr Asn Ala
 180 185 190

Lys Ile Ile Pro Tyr Ala Gly Leu Val Leu Val Ile Thr Val Thr Asp
 195 200 205

Asn Lys Gly Ala Phe Lys Tyr Ile Lys Pro Gln Ser Gln Phe Ile Val
 210 215 220

Asp Leu Gly Ala Tyr Leu Glu Lys Glu Ser Ile Tyr Tyr Val Thr Thr
 225 230 235 240

Asn Trp Lys His Thr Ala Thr Arg Phe Ser Ile Lys Pro Leu Glu Asp
 245 250 255

<210> 7
 <211> 65
 <212> PRT
 <213> respiratory syncytial virus B 9320

<400> 7

Met Gly Asn Thr Ser Ile Thr Ile Glu Phe Thr Ser Lys Phe Trp Pro
 1 5 10 15

Tyr Phe Thr Leu Ile His Met Ile Leu Thr Leu Ile Ser Leu Leu Ile
 20 25 30

Ile Ile Thr Ile Met Ile Ala Ile Leu Asn Lys Leu Ser Glu His Lys
 35 40 45

Thr Phe Cys Asn Lys Thr Leu Glu Leu Gly Gln Met Tyr Gln Ile Asn
 50 55 60

Thr
65

<210> 8
<211> 574
<212> PRT
<213> respiratory syncytial virus B 9320

<400> 8

Met Glu Leu Leu Ile His Arg Ser Ser Ala Ile Phe Leu Thr Leu Ala
1 5 10 15

Ile Asn Ala Leu Tyr Leu Thr Ser Ser Gln Asn Ile Thr Glu Glu Phe
20 25 30

Tyr Gln Ser Thr Cys Ser Ala Val Ser Arg Gly Tyr Phe Ser Ala Leu
35 40 45

Arg Thr Gly Trp Tyr Thr Ser Val Ile Thr Ile Glu Leu Ser Asn Ile
50 55 60

Lys Glu Thr Lys Cys Asn Gly Thr Asp Thr Lys Val Lys Leu Ile Lys
65 70 75 80

Gln Glu Leu Asp Lys Tyr Lys Asn Ala Val Thr Glu Leu Gln Leu Leu
85 90 95

Thr Gln Asn Thr Pro Ala Ala Asn Asn Arg Ala Arg Arg Glu Ala Pro
100 105 110

Gln Tyr Met Asn Tyr Thr Ile Asn Thr Thr Lys Asn Leu Asn Val Ser
115 120 125

Ile Ser Lys Lys Arg Lys Arg Arg Phe Leu Gly Phe Leu Leu Gly Val
130 135 140

Gly Ser Ala Ile Ala Ser Gly Ile Ala Val Ser Lys Val Leu His Leu
145 150 155 160

Glu Gly Glu Val Asn Lys Ile Lys Asn Ala Leu Leu Ser Thr Asn Lys
165 170 175

Ala Val Val Ser Leu Ser Asn Gly Val Ser Val Leu Thr Ser Lys Val
180 185 190

Leu Asp Leu Lys Ser Tyr Ile Asn Asn Gln Leu Leu Pro Ile Val Asn
 195 200 205

Gln Gln Ser Cys Arg Ile Ser Asn Ile Glu Thr Val Ile Glu Phe Gln
 210 215 220

Gln Lys Asn Ser Arg Leu Leu Glu Ile Thr Arg Glu Phe Ser Val Asn
 225 230 235 240

Ala Gly Val Thr Thr Pro Leu Ser Thr Tyr Met Leu Thr Asn Ser Glu
 245 250 255

Leu Leu Ser Leu Ile Asn Asp Met Pro Ile Thr Asn Asp Gln Lys Lys
 260 265 270

Leu Met Ser Ser Asn Val Gln Ile Val Arg Gln Gln Ser Tyr Ser Ile
 275 280 285

Met Ser Ile Ile Lys Glu Glu Val Leu Ala Tyr Val Val Gln Leu Pro
 290 295 300

Ile Tyr Gly Val Ile Asp Thr Pro Cys Trp Lys Leu His Thr Ser Pro
 305 310 315 320

Leu Cys Thr Thr Asn Ile Lys Glu Gly Ser Asn Ile Cys Leu Thr Arg
 325 330 335

Thr Asp Arg Gly Trp Tyr Cys Asp Asn Ala Gly Ser Val Ser Phe Phe
 340 345 350

Pro Gln Ala Asp Thr Cys Lys Val Gln Ser Asn Arg Val Phe Cys Asp
 355 360 365

Thr Met Asn Ser Leu Thr Leu Pro Ser Glu Val Ser Leu Cys Asn Thr
 370 375 380

Asp Ile Phe Asn Ser Lys Tyr Asp Cys Lys Ile Met Thr Ser Lys Thr
 385 390 395 400

Asp Ile Ser Ser Ser Val Ile Thr Ser Leu Gly Ala Ile Val Ser Cys
 405 410 415

Tyr Gly Lys Thr Lys Cys Thr Ala Ser Asn Lys Asn Arg Gly Ile Ile
 420 425 430

Lys Thr Phe Ser Asn Gly Cys Asp Tyr Val Ser Asn Lys Gly Val Asp
 435 440 445

Thr Val Ser Val Gly Asn Thr Leu Tyr Tyr Val Asn Lys Leu Glu Gly
 450 455 460

Lys Asn Leu Tyr Val Lys Gly Glu Pro Ile Ile Asn Tyr Tyr Asp Pro
 465 470 475 480

Leu Val Phe Pro Ser Asp Glu Phe Asp Ala Ser Ile Ser Gln Val Asn
 485 490 495

Glu Lys Ile Asn Gln Ser Leu Ala Phe Ile Arg Arg Ser Asp Glu Leu
 500 505 510

Leu His Asn Val Asn Thr Gly Lys Ser Thr Thr Asn Ile Met Ile Thr
 515 520 525

Thr Ile Ile Ile Val Ile Ile Val Val Leu Leu Ser Leu Ile Ala Ile
 530 535 540

Gly Leu Leu Leu Tyr Cys Lys Ala Lys Asn Thr Pro Val Thr Leu Ser
 545 550 555 560

Lys Asp Gln Leu Ser Gly Ile Asn Asn Ile Ala Phe Ser Lys
 565 570

<210> 9
 <211> 195
 <212> PRT
 <213> respiratory syncytial virus B 9320

<400> 9

Met Ser Arg Arg Asn Pro Cys Lys Phe Glu Ile Arg Gly His Cys Leu
 1 5 10 15

Asn Gly Arg Arg Cys His Tyr Ser His Asn Tyr Phe Glu Trp Pro Pro
 20 25 30

His Ala Leu Leu Val Arg Gln Asn Phe Met Leu Asn Lys Ile Leu Lys
 35 40 45

Ser Met Asp Lys Ser Ile Asp Thr Leu Ser Glu Ile Ser Gly Ala Ala
 50 55 60

Glu Leu Asp Arg Thr Glu Glu Tyr Ala Leu Gly Ile Val Gly Val Leu
65 70 75 80

Glu Ser Tyr Ile Gly Ser Ile Asn Asn Ile Thr Lys Gln Ser Ala Cys
85 90 95

Val Ala Met Ser Lys Leu Leu Ile Glu Ile Asn Ser Asp Asp Ile Lys
100 105 110

Lys Leu Arg Asp Asn Glu Glu Pro Asn Ser Pro Lys Ile Arg Val Tyr
115 120 125

Asn Thr Val Ile Ser Tyr Ile Glu Ser Asn Arg Lys Asn Asn Lys Gln
130 135 140

Thr Ile His Leu Leu Lys Arg Leu Pro Ala Asp Val Leu Lys Lys Thr
145 150 155 160

Ile Lys Asn Thr Leu Asp Ile His Lys Ser Ile Thr Ile Ser Asn Pro
165 170 175

Lys Glu Ser Thr Val Asn Asp Gln Asn Asp Gln Thr Lys Asn Asn Asp
180 185 190

Ile Thr Gly
195

<210> 10
<211> 93
<212> PRT
<213> respiratory syncytial virus B 9320

<400> 10

Met Ile Lys Met Thr Lys Pro Lys Ile Met Ile Leu Pro Asp Lys Tyr
1 5 10 15

Pro Cys Ser Ile Ser Ser Ile Leu Ile Ser Ser Glu Ser Met Val Ala
20 25 30

Thr Phe Asn His Lys Asn Ile Leu Gln Phe Asn His Asn His Leu Asp
35 40 45

Asn His Gln Cys Leu Leu Asn His Ile Phe Asp Glu Ile His Trp Thr
50 55 60

Pro Lys Asn Leu Leu Asp Thr Thr Gln Gln Phe Leu Gln His Leu Asn
65 70 75 80

Ile Pro Glu Asp Ile Tyr Thr Val Tyr Ile Leu Val Ser
85 90

<210> 11
<211> 2166
<212> PRT
<213> respiratory syncytial virus B 9320
<400> 11

Met Asp Pro Ile Ile Asn Gly Asn Ser Ala Asn Val Tyr Leu Thr Asp
1 5 10 15

Ser Tyr Leu Lys Gly Val Ile Ser Phe Ser Glu Cys Asn Ala Leu Gly
20 25 30

Ser Tyr Leu Phe Asn Gly Pro Tyr Leu Lys Asn Asp Tyr Thr Asn Leu
35 40 45

Ile Ser Arg Gln Ser Pro Leu Leu Glu His Met Asn Leu Lys Lys Leu
50 55 60

Thr Ile Thr Gln Ser Leu Ile Ser Arg Tyr His Lys Gly Glu Leu Lys
65 70 75 80

Leu Glu Glu Pro Thr Tyr Phe Gln Ser Leu Leu Met Thr Tyr Lys Ser
85 90 95

Met Ser Ser Ser Glu Gln Ile Ala Thr Thr Asn Leu Leu Lys Lys Ile
100 105 110

Ile Arg Arg Ala Ile Glu Ile Ser Asp Val Lys Val Tyr Ala Ile Leu
115 120 125

Asn Lys Leu Gly Leu Lys Glu Lys Asp Arg Val Lys Pro Asn Asn Asn
130 135 140

Ser Gly Asp Glu Asn Ser Val Leu Thr Thr Ile Ile Lys Asp Asp Ile
145 150 155 160

Leu Ser Ala Val Glu Asn Asn Gln Ser Tyr Thr Asn Ser Asp Lys Asn
165 170 175

His Ser Val Asn Gln Asn Ile Thr Ile Lys Thr Thr Leu Leu Lys Lys
 180 185 190

Leu Met Cys Ser Met Gln His Pro Pro Ser Trp Leu Ile His Trp Phe
 195 200 205

Asn Leu Tyr Thr Lys Leu Asn Asn Ile Leu Thr Gln Tyr Arg Ser Asn
 210 215 220

Glu Val Lys Ser His Gly Phe Ile Leu Ile Asp Asn Gln Thr Leu Ser
 225 230 235 240

Gly Phe Gln Phe Ile Leu Asn Gln Tyr Gly Cys Ile Val Tyr His Lys
 245 250 255

Gly Leu Lys Lys Ile Thr Thr Thr Tyr Asn Gln Phe Leu Thr Trp
 260 265 270

Lys Asp Ile Ser Leu Ser Arg Leu Asn Val Cys Leu Ile Thr Trp Ile
 275 280 285

Ser Asn Cys Leu Asn Thr Leu Asn Lys Ser Leu Gly Leu Arg Cys Gly
 290 295 300

Phe Asn Asn Val Val Leu Ser Gln Leu Phe Leu Tyr Gly Asp Cys Ile
 305 310 315 320

Leu Lys Leu Phe His Asn Glu Gly Phe Tyr Ile Ile Lys Glu Val Glu
 325 330 335

Gly Phe Ile Met Ser Leu Ile Leu Asn Ile Thr Glu Glu Asp Gln Phe
 340 345 350

Arg Thr Arg Phe Tyr Asn Ser Met Leu Asn Asn Ile Thr Asp Ala Ala
 355 360 365

Ile Lys Ala Gln Lys Asn Leu Leu Ser Arg Val Cys His Thr Leu Leu
 370 375 380

Asp Lys Thr Val Ser Asp Asn Ile Ile Asn Gly Lys Trp Ile Ile Leu
 385 390 395 400

Leu Ser Lys Phe Leu Lys Leu Ile Lys Leu Ala Gly Asp Asn Asn Leu
 405 410 415

Asn Asn Leu Ser Glu Leu Tyr Phe Leu Phe Arg Ile Phe Gly His Pro
420 425 430

Met Val Asp Glu Arg Gln Ala Met Asp Ala Val Arg Ile Asn Cys Asn
435 440 445

Glu Thr Lys Phe Tyr Leu Leu Ser Ser Leu Ser Thr Leu Arg Gly Ala
450 455 460

Phe Ile Tyr Arg Ile Ile Lys Gly Phe Val Asn Thr Tyr Asn Arg Trp
465 470 475 480

Pro Thr Leu Arg Asn Ala Ile Val Leu Pro Leu Arg Trp Leu Asn Tyr
485 490 495

Tyr Lys Leu Asn Thr Tyr Pro Ser Leu Leu Glu Ile Thr Glu Asn Asp
500 505 510

Leu Ile Ile Leu Ser Gly Leu Arg Phe Tyr Arg Glu Phe His Leu Pro
515 520 525

Lys Lys Val Asp Leu Glu Met Ile Ile Asn Asp Lys Ala Ile Ser Pro
530 535 540

Pro Lys Asp Leu Ile Trp Thr Ser Phe Pro Arg Asn Tyr Met Pro Ser
545 550 555 560

His Ile Gln Asn Tyr Ile Glu His Glu Lys Leu Lys Phe Ser Glu Ser
565 570 575

Asp Arg Ser Arg Arg Val Leu Glu Tyr Tyr Leu Arg Asp Asn Lys Phe
580 585 590

Asn Glu Cys Asp Leu Tyr Asn Cys Val Val Asn Gln Ser Tyr Leu Asn
595 600 605

Asn Ser Asn His Val Val Ser Leu Thr Gly Lys Glu Arg Glu Leu Ser
610 615 620

Val Gly Arg Met Phe Ala Met Gln Pro Gly Met Phe Arg Gln Ile Gln
625 630 635 640

Ile Leu Ala Glu Lys Met Ile Ala Glu Asn Ile Leu Gln Phe Phe Pro

645					650					655					
Glu	Ser	Leu	Thr	Arg	Tyr	Gly	Asp	Leu	Glu	Leu	Gln	Lys	Ile	Leu	Glu
			660					665					670		
Leu	Lys	Ala	Gly	Ile	Ser	Asn	Lys	Ser	Asn	Arg	Tyr	Asn	Asp	Asn	Tyr
		675					680					685			
Asn	Asn	Tyr	Ile	Ser	Lys	Cys	Ser	Ile	Ile	Thr	Asp	Leu	Ser	Lys	Phe
	690					695					700				
Asn	Gln	Ala	Phe	Arg	Tyr	Glu	Thr	Ser	Cys	Ile	Cys	Ser	Asp	Val	Leu
705					710					715					720
Asp	Glu	Leu	His	Gly	Val	Gln	Ser	Leu	Phe	Ser	Trp	Leu	His	Leu	Thr
				725					730					735	
Ile	Pro	Leu	Val	Thr	Ile	Ile	Cys	Thr	Tyr	Arg	His	Ala	Pro	Pro	Phe
			740					745					750		
Ile	Lys	Asp	His	Val	Val	Asn	Leu	Asn	Glu	Val	Asp	Glu	Gln	Ser	Gly
		755					760					765			
Leu	Tyr	Arg	Tyr	His	Met	Gly	Gly	Ile	Glu	Gly	Trp	Cys	Gln	Lys	Leu
	770					775					780				
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785					790					795					800
Lys	Phe	Ser	Ile	Thr	Ala	Leu	Ile	Asn	Gly	Asp	Asn	Gln	Ser	Ile	Asp
				805					810					815	
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			820					825					830		
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	850					855					860				
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Ile Leu Asp Asp Phe Lys Val Ser Leu Glu Ser Ile Gly Ser Leu Thr
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Arg Asn Ile Trp Leu Tyr Asn Gln Ile Ala Leu Gln Leu Arg Asn His
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Ala Leu Cys His Asn Lys Leu Tyr Leu Asp Ile Leu Lys Val Leu Lys
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His Leu Lys Thr Phe Phe Asn Leu Asp Ser Ile Asp Met Ala Leu Ser
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Leu Tyr Met Asn Leu Pro Met Leu Phe Gly Gly Gly Asp Pro Asn Leu
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Leu Tyr Arg Ser Phe Tyr Arg Arg Thr Pro Asp Phe Leu Thr Glu Ala
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Ile Val His Ser Val Phe Val Leu Ser Tyr Tyr Thr Gly His Asp
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Leu Gln Asp Lys Leu Gln Asp Leu Pro Asp Asp Arg Leu Asn Lys
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Phe Leu Thr Cys Ile Ile Thr Phe Asp Lys Asn Pro Asn Ala Glu
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Phe Val Thr Leu Met Arg Asp Pro Gln Ala Leu Gly Ser Glu Arg
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Gln Ala Lys Ile Thr Ser Glu Ile Asn Arg Leu Ala Val Thr Glu
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Val Leu Ser Ile Ala Pro Asn Lys Ile Phe Ser Lys Ser Ala Gln
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His Tyr Thr Thr Thr Glu Ile Asp Leu Asn Asp Ile Met Gln Asn
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Thr	Thr	Asp	Ile	Asn	Arg	Ala	Thr	Asp	Met	Met	Arg	Lys	Asn	Ile
1160						1165					1170			
Thr	Leu	Leu	Ile	Arg	Ile	Leu	Pro	Leu	Asp	Cys	Asn	Lys	Asp	Lys
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Arg	Glu	Leu	Leu	Ser	Leu	Glu	Asn	Leu	Ser	Ile	Thr	Glu	Leu	Ser
1190						1195					1200			
Lys	Tyr	Val	Arg	Glu	Arg	Ser	Trp	Ser	Leu	Ser	Asn	Ile	Val	Gly
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Val	Thr	Ser	Pro	Ser	Ile	Met	Phe	Thr	Met	Asp	Ile	Lys	Tyr	Thr
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Tyr Thr Ser Asn Leu Phe Tyr Ile Ser Tyr Asn Phe Ser Asp Asn				
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Pro Lys Ser Cys Ile Ser Gly Asn Thr Glu Ser Met Met Thr Ser				
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Ser Asn Ile Leu Pro Val Phe Asn Val Val Gln Asn Ala Lys Leu
 2015 2020 2025

Ile Leu Ser Arg Thr Lys Asn Phe Ile Met Pro Lys Lys Thr Asp
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